RESEARCH PROGRAM ON Livestock

More meat, milk and eggs by and for the poor

Characterization of the livestock production system and potential for enhancing productivity in Tohwe Nkayi District, Zimbabwe

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1 Introduction

The Gendered Feed Assessment Tool (G-FEAST) was implemented to characterize the livestock production systems in Nkayi District, Zimbabwe. The G-FEAST tool combines both qualitative and quantitative research approaches to identify if farmers perceive feed as a problem and what are the potential solutions (Lukuyu et al. 2019). It raises the viewpoints and perspectives of both women and men farmers in the community regarding feeding practices and general crop and livestock production. It also considers the constraints that households face, such as the labour burden on women and their limited access to and control over resources. The G-FEAST exercises were carried out on the 6 May 2021 in Ward 17 at Tohwe Primary School (18o56"16" S270 43"57"). The FDG discussions lasted for 3 and a half hour and were done by female facilitators. Nkayi is a district in Matabeleland North, Zimbabwe, about 100 km (62 mi) west of Kwekwe and 168 km (104 mi) northeast of Bulawayo. It is poor rural district in Natural Region IV and is a predominantly rain fed agricultural region. Farmers remain vulnerable to climate change, as low and variable rainfall (<650 mm annually) and regular droughts (every 2 of 5 years) make production difficult. Nkayi farms are predominately maize and cattle producing farms. All farmers grow maize and approximately two-thirds also keep cattle. The area has poorly developed grazing systems which are overgrazed.

2 Process and sample description

A G-FEAST survey was carried out with the help of the local extension staff on pre-selection of farmers. Two gendered focus group discussions (FGDs) were carried out separately, one with 12 men participating and another with 12 women participating. Each of the G-FEAST exercises lasted for 2.5–3 hours each and was held at Tohwe Primary School, the venue was selected for the convenience of the respondents. Thereafter, six respondents were selected for individual interviews from each of the groups. The selection of the participants for individual interviews was based on the size of land owned. This was considered for both male-headed and female-headed households. The composition of the sample is shown in Table 1. Each group had a facilitator. Before each session, a consent note seeking permission for the interviews from farmers was read to them in the local language by the local extension staff. Farmers agreed to the discussions and signed the consent forms before the sessions commenced. Each session had a scribe to keep a record of the proceedings and a timekeeper to manage time.

Table 1: Male and female respondents for individual interviews by farm size

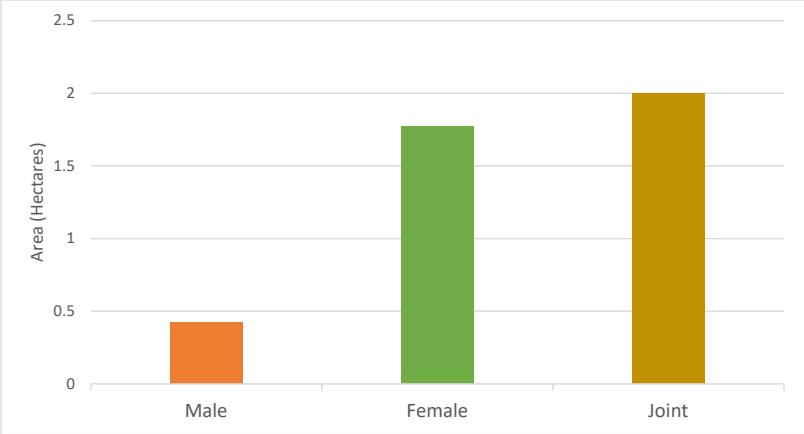
Individual interviews	Number of Female respondents	Number of male respondents
Small farm size (0-0.4ha)	2	2
Medium farm size (0.4ha-5ha)	2	2
Large farm size (>5ha)	2	2
Total	6	6

3 Results

3.1 Farming systems

The farming system practiced in Tohwe area is primarily an agro-pastoral extensive mixed crop-livestock system. Average farm sizes in Tohwe, Nkayi District are about 7ha (17.5 acres), with most of the land being used for crop production (both food and fodder crops). The average household size comprises 7 people. The largest proportion of female-headed households falls in the large-scale farms category whereby female-headed households have on average 7ha of land. This implies that women in Nkayi District also have land rights just like men. In both G-FEAST discussion groups (men and women), there was consensus that female headed households are fewer compared to male headed household's men are sharing land ownership rights equally with their spouses. Land ownership is mostly communal system whereby farmers use land that is owned by the local government. Figure 1 illustrates land ownership by gender within a household.

Figure 1: Land ownership by gender.



A majority of households in the area grow a variety of food crops, including maize (*Zea mays*), pearl millet (*pennisetum glaucum*), sorghum (*sorghum bicolar*) and Bambara nut (*Vigna subterranea*). Maize is grown on a large scale by both male and female farmers. Maize as a staple food it is grown on a large scale for consumption and commercial sale also. Figure 2 indicates that female-headed households are more likely to cultivate sorghum than male headed households. Male headed households are likely to cultivate pearl millet more as compared to female headed.

Figure 2: Dominant crop types in average hectares cultivated by gender of household head (up to 5) .

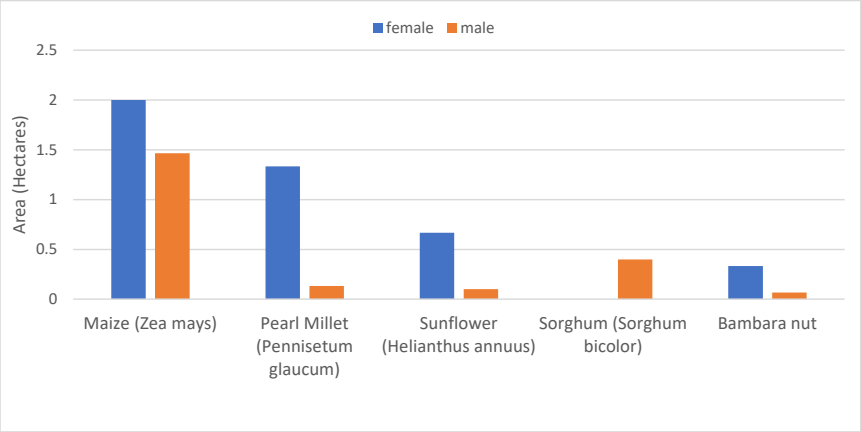
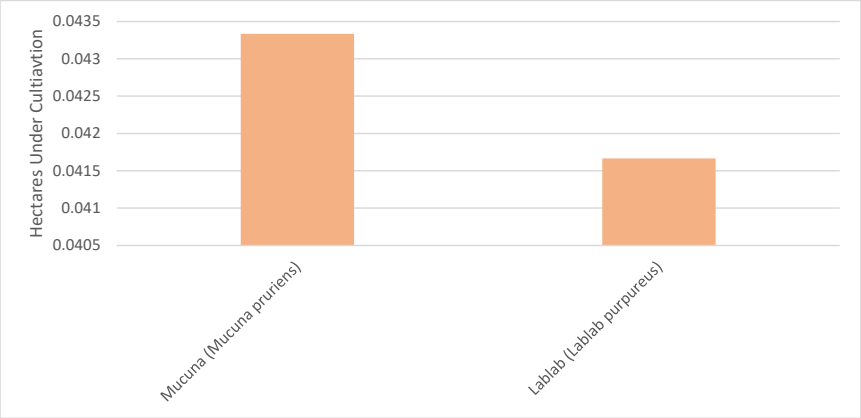


Figure 3 shows farmers also utilize their land to grow forage crops such as Lablab (Lablab purpureus) and mucuna (Mucuna pruriens). Mucuna is grown on large plots as compared to lablab. Information gathered during the focus group discussions showed that growing of fodder crops is new in the area and only a few farmers are involved.

Figure 3: Dominant fodder crops types in the study area.



The cropping season of the year for farmers comprises of two seasons called Intwasa and Ihobo (Table 2). During the Intwasa season farmers will be preparing their land and start planting towards its end. The cropping season will continue in to the Ihlobo season where farmers will be weeding, followed by the time when food is in abundance then the harvesting time. The Ihlobo season is characterized by a dry spells during the start followed by short and moderate rain towards the end. Ikwindla, which is characterized by the end of the rain season and it starts in April and end in May. The most common farming activities during this time include harvesting and collection of crop residues. The dry season is referred to as Busika, rainfall availability is very low such that farmers will be concentrating on other crop related activities such as repairing crop field fences, and gardening. It runs from June to August.

Table 2: Seasonal cropping patterns in Nkayi District

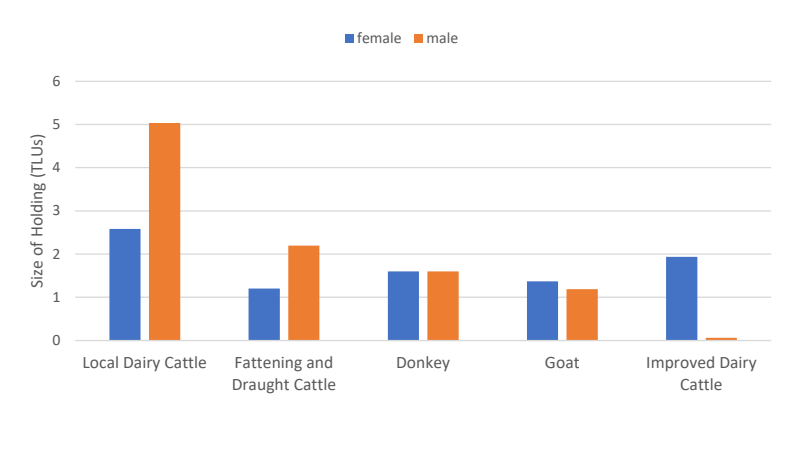
Name of season	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Ihlobo	■	■	■									
Ikwindla				■	■							
Intwasa									■	■	■	■
Busika						■	■	■				

Labour is not always available as and when required by farmers. The minimum daily labour cost is ZWL800 and the maximum rate is ZWL1,000. The labour costs vary with the type of farming activity and labour becomes scarce during the planting and weeding season. The scarcity of labour is due to the migration of rural to urban youth looking for paid jobs. The percentage migration of the youth from Nkayi is 30%. There is no difference in the wage rate paid to a man compared to a woman as long as work is delivered as per expectations and quality.

3.2 Livestock production system

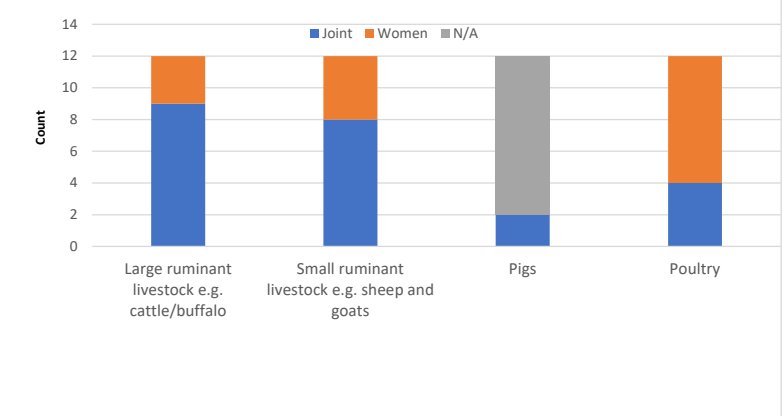
Farmers in Tohwe area are predominantly cattle keepers, as shown in Figure 4. Other livestock kept include goats and donkeys. Cattle are kept mainly for income, milk, meat draught power and as a source of manure (FGD data). The focus groups for men and women found no difference between genders in their purposes for rearing the main livestock species. The most dominant breeds among cattle are the local breeds and crosses between improved breeds and local breeds. Male headed households have larger holdings of local dairy, fattening and draught cattle than Female headed Households. In addition female-headed households dominate in improved dairy cattle compared to male headed households. Cattle rely on grazing as the main source of feeding and sometimes fed with crop residues during the dry season. Common livestock disease is black leg in cattle and pulpy kidney in goats, both men and women farmers rely mainly on public and private (from other organisations and NGOs) extension and veterinary officers in the area. Majority of farmers (99%) often rely on bull services for reproduction, using their improved and indigenous bulls. Artificial insemination (AI) services are not readily available to both men and women farmers.

Figure 4: Dominant livestock categories in TLUs by gender of household head (up to 5).



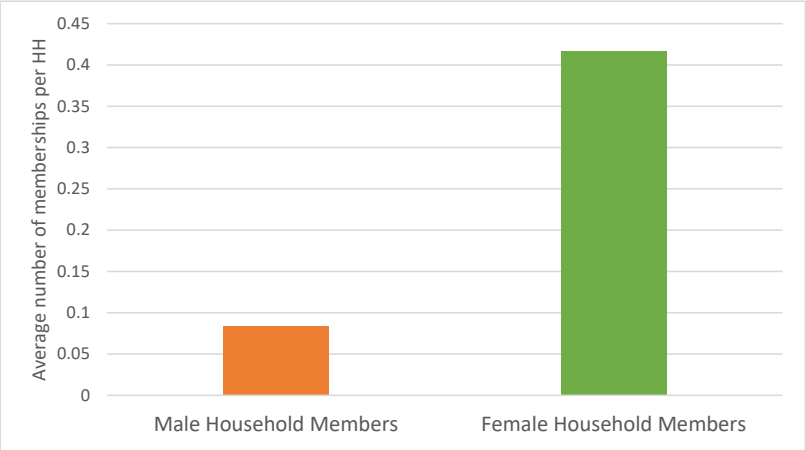
Decision-making process regarding large and small ruminants is mostly done jointly or by women in female headed households (Figure 5). This implies that in Nkayi District, both men and women are actively involved in livestock management decisions. In Nkayi District financial service (credit) are not readily available for both women and men. Banks offers personal loans which are not directed to support farming activities.

Figure 5: Gendered decision-making on livestock.



Membership to cooperatives and farmer organisations is dominated by women than men (Figure 6). In male headed households women are encouraged to join cooperatives while men consider themselves busy with other farm duties (FDG data).

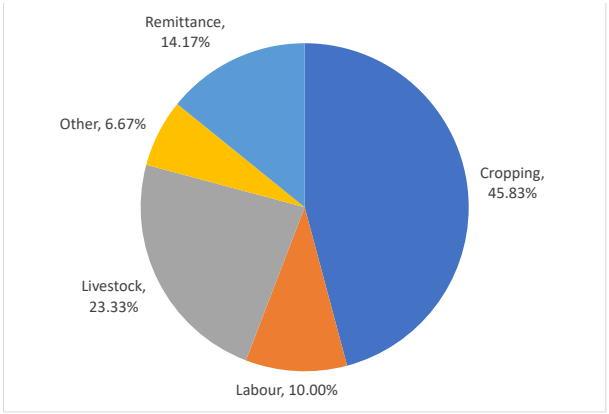
Figure 6: Coop/farmer organization memberships by gender.



3.3 Major sources of income

Figure 7 presents the major sources of household income within Tohwe, Nkayi District. Results indicate that crop-related (food crops) activities, contribute the highest share (45.8%) to household income. This includes the sale of maize, sorghum and vegetables. Livestock activities contributes 23.3% share this includes income from cattle, goats, sheep and poultry sales. Offering manual labour contributes 10% to other farmers, remittance have a 14.2% contribution and other (6.7%) sources of income which includes activities like selling hand crafts have a 6.7% contribution on household income.

Figure 7: Average household income.



As for women's incomes, food and cash crops and remittances contribute the highest share of the total. Cash crops include vegetable crops like tomatoes and onions. Other income sources include poultry, hand craft and fattening small stock (goats) from either spouse or relatives (Figure 8)

Figure 8: Relative contribution of major sources of income sources to household and women's income.

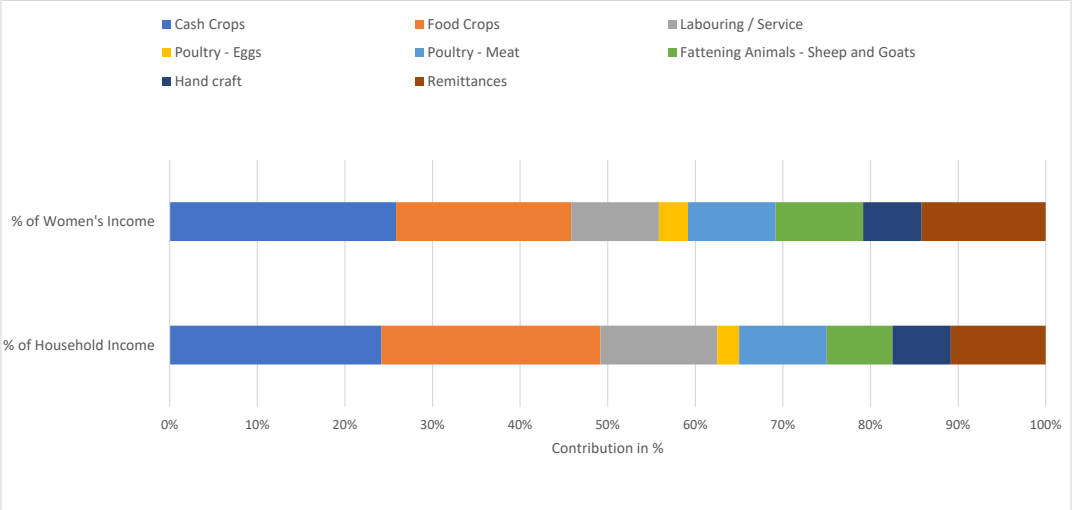
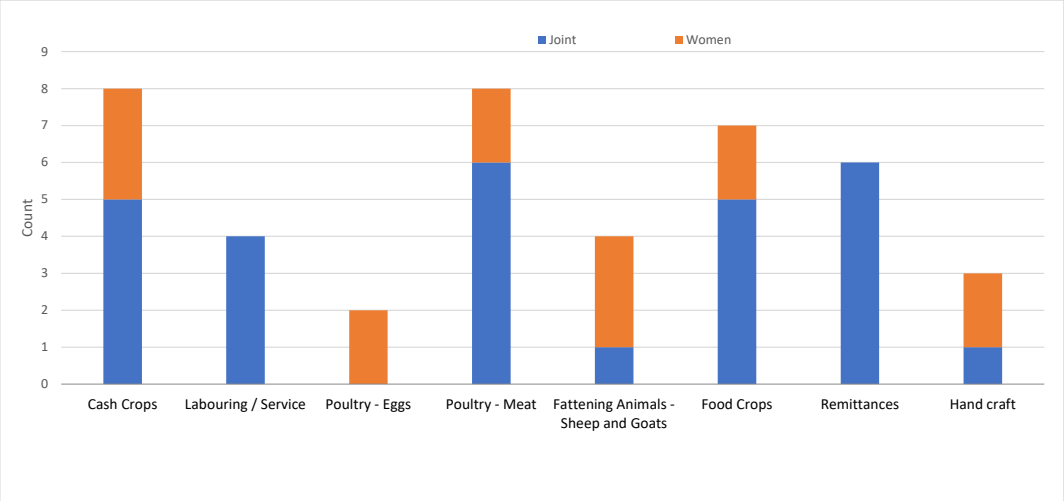


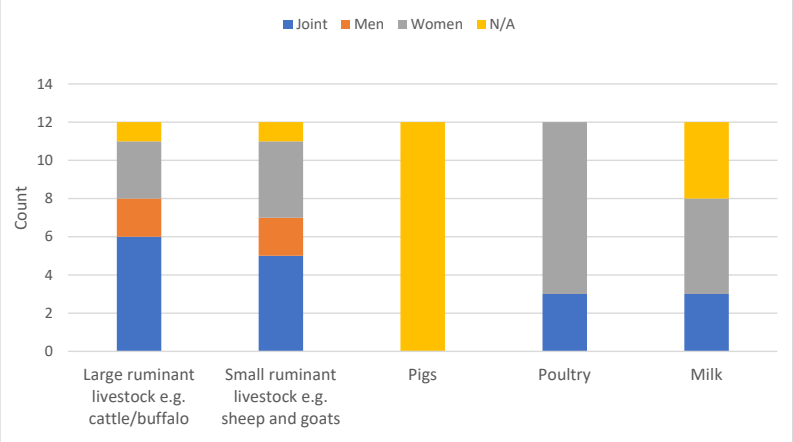
Figure 9 indicates that joint decision-making is done on income from cash crops, labouring/ service poultry meat food crops, remittances and hand craft, woman make decisions on income from poultry-eggs.

Figure 9: Gendered decision-making on major sources of household income.



If focus is on income from the sale of poultry, it can be observed that women make most decisions. There is, however, joint decision-making in the sale of large and small ruminants livestock and milk (Figure 10). This implies there is a lot of inclusivity on income from livestock and that women are also involved in decision-making on sales of livestock. Information from the focus group discussion indicated that milk is mainly used for home consumption, only surplus is sold.

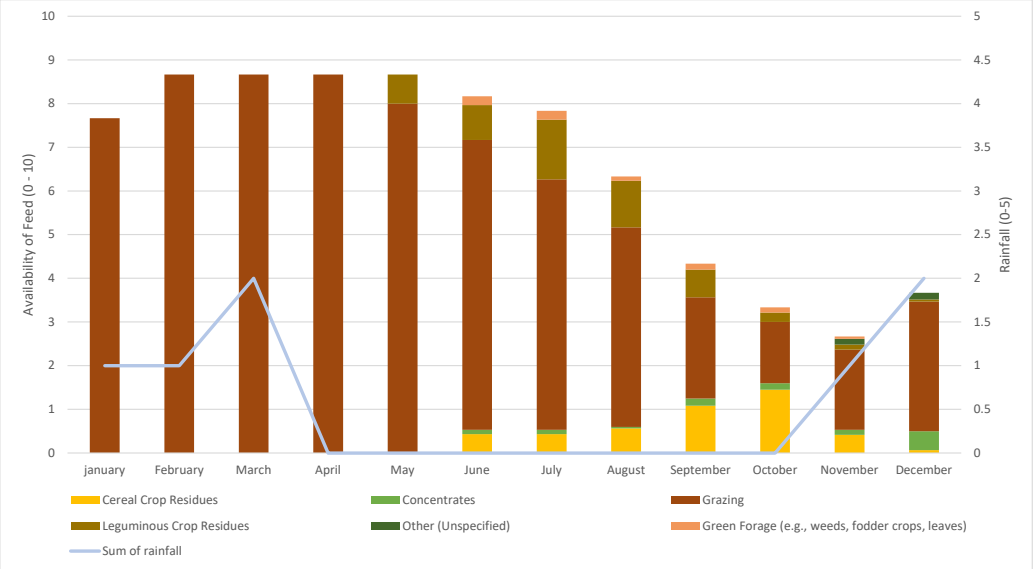
Figure 10: Gendered decision-making on sales of livestock and milk.



3.4 Major feed sources

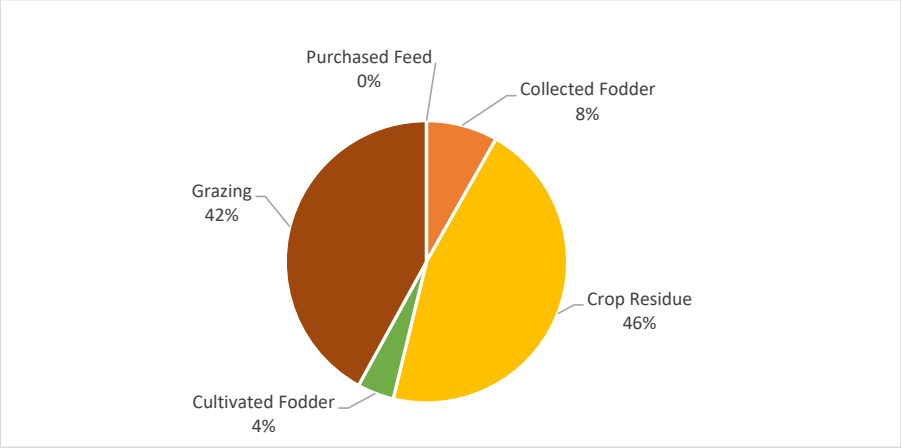
Livestock diets are primarily grazing, legumes crop residue and cereal crop residues, green forage, and concentrates as shown (Figure 11). The contribution made by these feed sources to the diet varies throughout the year. Grazing makes up the most significant portion of animal diet. Farmers utilize their expansive land to graze their animals on naturally occurring grasses. Grazing intensity increases during the wet season (December–June) and start deteriorating during the winter (May - August) to start of summer (November–December). During the dry season, cereal crop residues and legumes are found in larger quantities in the diet. Green forages and collected feeds are incorporated more during the wet season. Concentrates are used in very little quantities; they appear higher in the month of December compared to the rest of the year.

Figure 11: Seasonal availability of feeds in relation to rainfall patterns in Nkayi District throughout the year.



Crop residues contributes 46% to the total dry matter intake on farms, followed by grazing (42%), collected fodder and cultivated fodder contribute 8% and 4% respectively (Figure 12). Cultivated fodder is not common in the district, only a few farmers planted fodder crops and the seed usually come from the newly introduced projects (FDG data).

Figure 12: Contribution of dietary dry matter (DM) to the total livestock diets by feed source on farms in Nkayi District.



The contributions of total ME (MJ/Kg) and crude protein (CP %) are shown in Figures 13 and 15, respectively. It was observed that crop residues contribute the highest share in terms of ME (MJ/Kg) at 45% followed by grazing at 41%. Collected fodder contributes 9% of the total ME (MJ/Kg) and cultivated fodder contributes 5%. Grazing contributed the highest (43%) in terms of crude protein intake followed by crop residues (43%). Cultivated and collected fodder contributed 10% and 8% respectively.

Figure 13: Metabolizable energy intake by source.

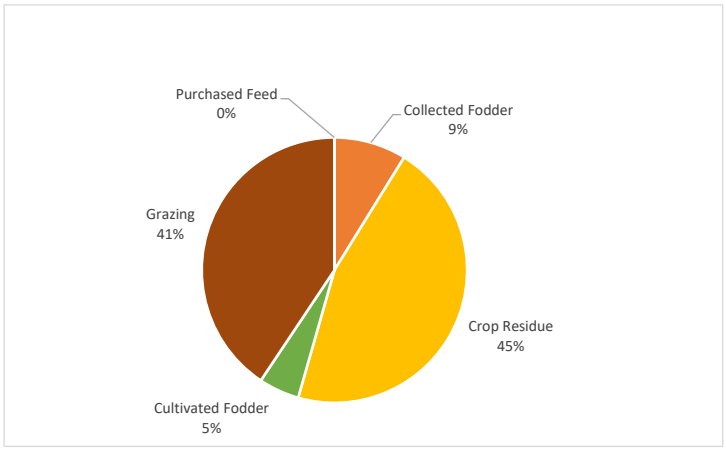
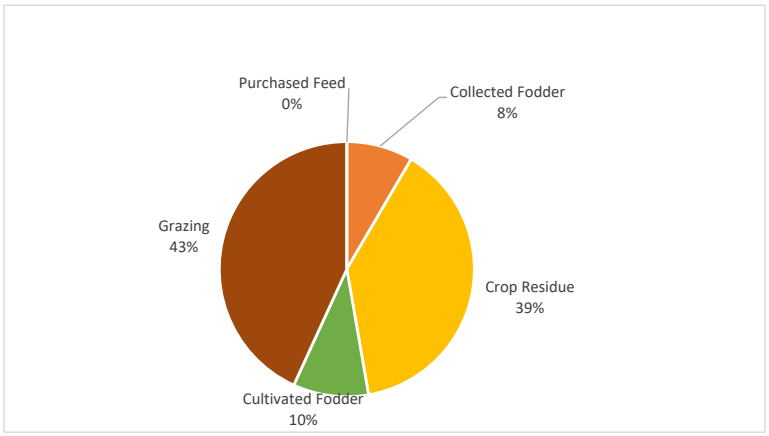


Figure 14: Crude protein intake by source.



3.5 Gender division of labour and gendered decision-making on livestock, feed-related activities

Decision-making roles of men and women regarding crops and feeding are shown in Figure 15. It is evident that in a household, both men and women make joint decisions about what to grow, where, and how with women dominating in deciding what to grow and how to use the crop residues. Regarding decisions relating to feeds (type of fodder, where to grow, what to purchase), men are the sole decision makers.

Figure 15: Gendered decision-making on crop and feeding.

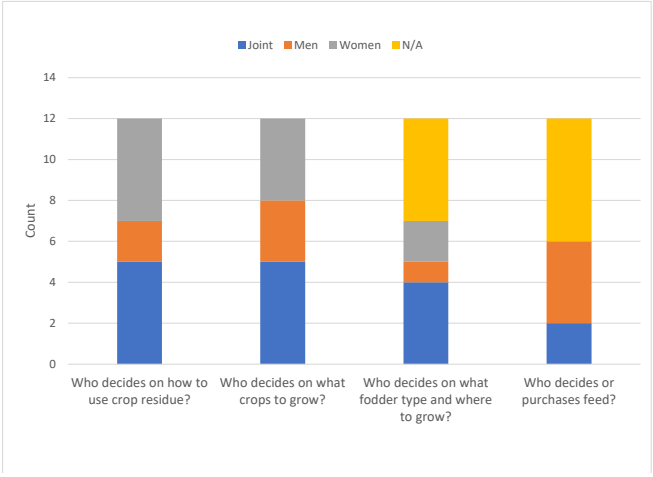
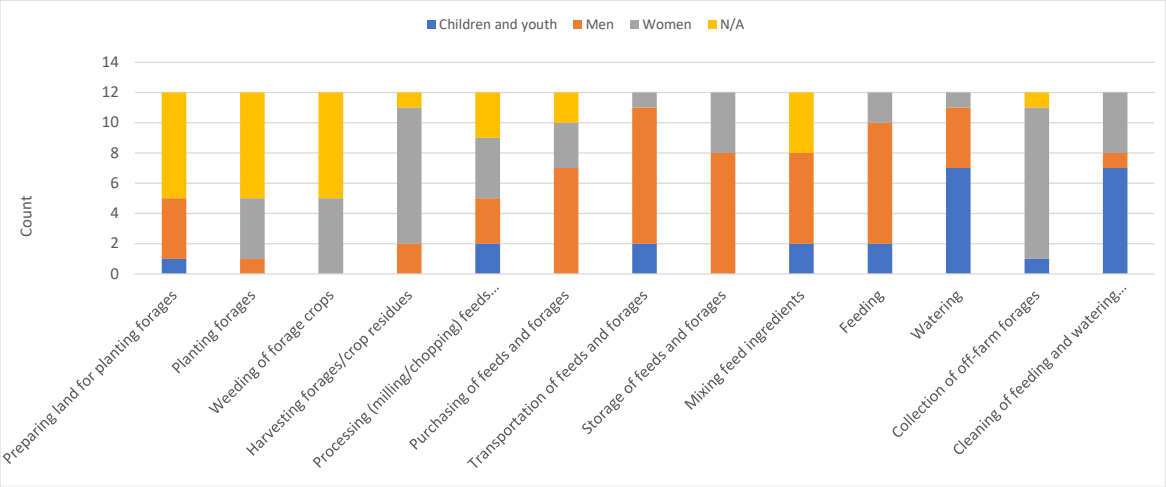


Figure 16 shows different activities in forage production and the different roles played by household members. Women dominate in most of the forage production activities, including ploughing, harvesting, and processing of feed except for land preparation for planting forages. Men participated in activities like feeding, transportation and storage of feed and forages. Cleaning of feeding and watering is mainly done by children and youth. In general, it is observed that all household members provide considerable labour in the production and management of forages and livestock. However information obtained from the men and women focus group discussion clearly shows that planting of forage crops is not popular with many farmers.

Figure 16: Gender division of labour in feed production, harvesting and feeding.



3.6 Problems and opportunities

Farmers were asked to list and rank the five most important problems affecting livestock production in their area and possible solutions (Table 3). The main challenges identified by both men and women in the communities are feed scarcity during the dry season, low market prices, water , transport and theft of cattle. Feed scarcity was identified as the main problem by both men and women. Water availability was also cited as a major problem especially during the dry season where most of the temporary water sources dry. During this time farmers rely on boreholes which require manual labour to water the animals. Low market prices were cited by both men and women and this situation is consistent throughout the year where buyers do not offer good prices.

Table 3: Problems, issues and proposed farmer solutions within production systems

Main Problem	Proposed farmer solution	Ranking by women	Ranking by men
Feed scarcity	Capacitate on feed formulation and Preservation using locally available feed stuffs. Growing fodder crops use of commercial feed	1	1
Water	Dam scooping Construct dams in the area. Solarising existing boreholes Repairing non-functional boreholes	2	3
Transport	Opening a input and drug shop at ward level To always stock most used drugs inputs to be sold at an affordable price	5	4
Theft	Give stiff penalties for those implicated Working hand in hand with the law enforcing agents	4	5
Low market prices	Look for buyers who are willing to pay more selling direct to abattoirs revive beef sale points making use of the auction system sale scales on local sale pens.	3	2

4 Potential interventions

The proposed interventions include:

- Train farmers on fodder production and introducing fodder and dual purpose crops
- Train farmers on the importance of water harvesting and proper storage and use
- Capacitate farmers on feed formulation and preservation using locally available feed stuffs.
- Growing fodder crops and use of commercial feed to improve the market value of animals especially during the dry season.
- Making use of the auction system and attract more buyers

5 Conclusion

Farmers in ward 17 Nkayi District derive focus in keeping large and small ruminants and poultry for income as well as meat for household consumption. Feed shortage during the dry season, water unavailability and low market prices were highlighted as the key issues in the area. Farmers use crop residues to supplement their animals but these feed stuffs are of poor quality and are not adequate to sustain their animals throughout the dry season. Animals rely mainly on grazing, therefore, introduction of improved forage varieties in existing pastures should be encouraged. Farmers should be exposed to improved forage varieties and offered training in forage production and management as well as pasture improvement.

6 References and further reading

Lukuyu, B., Eerdewijk, A. Van, Kinati, W., Sultana, N., Mulema, A. and Duncan, A.2019. *Gendered Feed Assessment Tool (G-FEAST) individual farmer interview questionnaire*. Nairobi, Kenya: ILRI. https://hdl.handle.net/10568/100244

Lukuyu, B., Eerdewijk, A. Van, Kinati, W., Sultana, N., Mulema, A. and Duncan, A. 2019. *Gendered Feed Assessment Tool (G-FEAST) focus group discussion guide*. Nairobi, Kenya: ILRI. https://hdl.handle.net/10568/100243

Lukuyu, B., Maina, K., Namutebi, P., Allen, M., Nanyeenya, W., Faitwa, W., Kalungi, F. and Ismael, B. 2021. *Characterisation of the livestock production system and potential for enhancing productivity in Kiboga District, Uganda*. https://hdl.handle.net/10568/113240